

### REMARKS/ARGUMENTS

Claims 1 – 28 are presented for reconsideration and further examination in view of the foregoing amendments and following remarks.

In the outstanding Office Action, claims 1 – 3, 5 – 10, 12 – 17 and 19 – 28 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,411,626 to Becker et al. (hereinafter referred to as “the Becker et al. ‘626 patent”); claims 1 – 3, 5 – 10, 12 – 17 and 19 – 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. patent no. 6,691,764 to Embert et al. (hereinafter referred to as “the Embert et al. ‘764 patent”) in view of the Becker et al. ‘626 patent; claims 4 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over the Becker et al. ‘626 patent in view of reference no. WO 00/08415 (hereinafter referred to as “the WO ‘415 reference”); rejected claim 11 under 35 U.S.C. §103(a) as being unpatentable over the Becker ‘626 patent in view U.S. Patent No. 6,126,732 to Hofmann et al. (hereinafter referred to as “the Hofmann ‘732 patent”); additionally rejected claims 4 and 18 under 35 U.S.C. §103(a) as being unpatentable over the Embert et al. ‘764 patent in view of the Becker et al. ‘626 patent in further view of the WO ‘415 reference; and additionally rejected claim 11 under 35 U.S.C. §103(a) as being unpatentable over the Embert et al. ‘764 patent in view of the Becker et al. ‘626 patent in further view of the Hofmann ‘732 patent.

By this Response and Amendment, claims 1, 16 and 27 – 28 have been amended to recite “generating a three-dimensional (3D) virtual model of a dental coping for said at least one tooth *based on said 3D digital data, the virtual model having an outer surface and an inner surface...*” and to recite “milling an inner surface of said wax model corresponding to said inner surface of said virtual model...;” and, as amended, the Examiner’s rejections are traversed.

Support for the amendments to claims 1, 16 and 27 – 28 can be found in the first

paragraph on page 11 of the originally filed specification. Therefore, it is respectfully submitted that the above amendments do not introduce any new matter to this application within the meaning of 35 U.S.C. §132.

**Rejection Under 35 U.S.C. §102(b)**

The Examiner rejected claims 1 – 3, 5 – 10, 12 – 17 and 19 – 28 as being clearly anticipated by the Becker et al. '626 patent.

**Response**

Applicants note the Examiner's indication that amending the claims to recite that the 3-D virtual model corresponds to actual image data would overcome the 102 rejection to the Becker et al. '626 patent and that a further recitation of "milling an inner surface of said wax model corresponding to said inner surface of said virtual model" would overcome the rejection regarding the Embert '764 patent in view of the Becker et al. '626 patent.

By this Response and Amendment, independent claims 1, 16, 27 and 28 have been amended to recite "generating a three-dimensional (3D) virtual model of a dental coping for said at least one tooth based on said 3D digital data, the virtual model having an outer surface and an inner surface..." and "milling an inner surface of said wax model corresponding to said inner surface of said virtual model." As amended, the rejections to these claims and to the claims dependent thereon are traversed as all of the features of the independent claims are not present in the cited prior art.

For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art

reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP §2131.

Amended independent claim 1 recites “[a] method for the fabrication of a dental coping of a dental prosthesis of at least one tooth to be fitted over a tooth preparation, comprising: a) providing a three-dimensional (3D) digital data relating to the patient’s dentition, said 3D data including data representative of the surface topology of said preparation and its surroundings; b) generating a three-dimensional (3D) virtual model of a dental coping for said at least one tooth *based on said 3D digital data*, the virtual model having an outer surface and an inner surface for fitting over a portion of the surface of the tooth preparation in close engagement; c) generating a computerized numerical control (CNC) set of instructions corresponding to the 3D model of said coping; d) based on said set of instructions, fabricating a wax model of said coping by a computerized numerical control (CNC) milling machine by milling an outer surface of said wax model corresponding to said outer surface of said virtual model and by *milling an inner surface of said wax model corresponding to said inner surface of said virtual model*; and e) fabricating a dental coping from the wax model.”

Amended independent claim 16 recites “[a] method for the fabrication of a coping wax model to be used for the fabrication of a dental coping of a dental prosthesis of at least one tooth to be fitted over a tooth preparation, comprising: i. providing a three-dimensional (3D) digital data relating to the patient's dentition, said 3D data including data representative of the surface topology of said preparation and its surroundings; ii. generating a three-dimensional (3D) virtual model of a dental coping for said at least one tooth *based on said 3D digital data*, the virtual model having an outer surface and an inner surface for fitting over a portion of the surface of the tooth preparation in close engagement; iii. generating a computerized numerical control (CNC)

set of instructions corresponding to the 3D model of said coping; and iv. based on said set of instructions, fabricating a wax model by a computerized numerical control (CNC) milling machine by milling an outer surface of said wax model corresponding to said outer surface of said virtual model and by *milling an inner surface of said wax model corresponding to said inner surface of said virtual model.*”

Amended independent claim 27 recites “[a] system for the fabrication of a dental coping of a dental prosthesis of at least one tooth to be fitted over a tooth preparation, comprising: A. means for providing a three-dimensional (3D) digital data relating to the patient's dentition, said 3D data including data representative of the surface topology of said preparation and its surroundings; B. means for generating a three-dimensional (3D) virtual model of a dental coping for said at least one tooth *based on said 3D digital data*, the virtual model having an outer surface and an inner surface for fitting over a portion of the surface of the tooth preparation in close engagement; C. means for generating a computerized numerical control (CNC) set of instructions corresponding to the 3D model of said coping; D. means for fabricating a wax model of said coping by a computerized numerical control (CNC) milling machine by milling an outer surface of said wax model corresponding to said outer surface of said virtual model and by *milling an inner surface of said wax model corresponding to said inner surface of said virtual model*; and E. means for fabricating a dental coping from the wax model.”

Amended independent claim 28 recites: “[a] system for the fabrication of a coping wax model to be used for the fabrication of a dental coping of a dental prosthesis of at least one tooth to be fitted over a tooth preparation, comprising: a. means for providing a three-dimensional (3D) digital data relating to the patient's dentition, said 3D data including data representative of the surface topology of said preparation and its surroundings; b. means for generating a three-

dimensional (3D) virtual model of a dental coping for said at least one tooth *based on said 3D digital data*, the virtual model having an outer surface and an inner surface for fitting over a portion of the surface of the tooth preparation in close engagement; c. means for generating a computerized numerical control (CNC) set of instructions corresponding to the 3D model of said coping; and d. means for fabricating a wax model based on said set of instructions by a computerized numerical control (CNC) milling machine by milling an outer surface of said wax model corresponding to said outer surface of said virtual model and by *milling an inner surface of said wax model corresponding to said inner surface of said virtual model.*”

The Becker et al. ‘626 patent discloses an apparatus for preparing a crown to be affixed on a tooth stump. The objective of the device disclosed in the Becker et al. ‘626 patent is to reduce the amount of waste generated in making the crown from a wax molding material. This objective is met by determining a limit on the amount of material that can be machined from the molding material. The inner limit is defined by the dimensions of the tooth stump. To form a prosthesis, a lump of wax molding material is clumped over a model of the tooth stump and then machined so that the wax molding resembles a tooth. Thus, a minimal amount of molding material can be used without fear of machining the material to a point where a void is produced in the mold.

In contrast to the presently claimed invention, the Becker et al. ‘626 patent does not disclose, teach, or suggest “fabricating a wax model by a computerized numerical control (CNC) milling machine by milling an outer surface of said wax model corresponding to said outer surface of said virtual model and by milling an inner surface of said wax model corresponding to said inner surface of said virtual model” as recited in each of the amended independent claims of the present application. Rather, the inner surface of the wax molding material in the Becker et al.

'626 patent is formed by clumping the wax over the model of the tooth stump as opposed to milling the inside of the wax. As the Becker et al. '626 patent does not disclose the features discussed above, the Becker et al. '626 patent neither anticipates the presently claimed invention nor renders the presently claimed invention obvious. As such, the presently claimed invention is patentable over the cited prior art.

Also, as the Examiner has indicated that the Becker et al. '626 patent cannot in combination, render the presently claimed invention obvious, it follows that the Becker et al. '626 patent cannot, by itself, anticipate the presently claimed invention. *See May 4, 2005 Examiner Interview Summary.*

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection under 35 U.S.C. §102(b).

### **Rejections Under 35 U.S.C. §103(a)**

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) the prior art references teach or suggest all of the claim limitations. *Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970).

#### **1. The Embert Et Al. '764 Patent In View Of The Becker Et Al. '626 Patent**

The Examiner rejected claims 1 – 3, 5 – 10, 12 – 17 and 19 – 28 as being unpatentable over the Embert et al. '764 patent in view of the Becker et al. '626 patent.

### **Response**

The arguments above with respect to the Becker et al. '626 patent are incorporated by reference.

Claims 1, 16, 27 and 28 have been amended and, as amended, the rejections thereto are respectfully traversed as all of the features of the independent claims are not disclosed, taught or suggested by the cited prior art.

The Embert et al. '764 patent does not account for the deficiencies of the Becker '626 patent. The Embert et al. '764 patent discloses a method for producing a dental prosthesis having a detailed surface. The prosthesis is formed by filling a mold with a material such that the outer surface of the prosthesis resembles a tooth.

In contrast to the presently claimed invention, the Embert et al. '764 patent is silent as to the inner surface of a wax model. It does not disclose, teach, or suggest "milling an inner surface of said wax model corresponding to said inner surface of said virtual model" as recited in each of the amended independent claims of the present application. As the Embert et al. '764 patent does not disclose milling an inner surface of the wax model such that it corresponds to an inner surface of the virtual model, the Embert et al. '764 patent does not render the presently claimed invention obvious. As such, the presently claimed invention is patentable over the cited prior art.

Also, as the Examiner has indicated that the Embert et al. '764 patent does not, in combination, render the presently claimed invention obvious, Applicants submit that the presently claimed invention is patentable over the Embert et al. '764 patent in combination with the Becker et al. '626 patent.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection under 35 U.S.C. §103(a).

**2. The Becker et al. '626 Patent In View Of The WO '415 Reference**

The Examiner rejected claims 4 and 18 as being unpatentable over the Becker et al. '626 patent in view of the WO '415 reference.

**Response**

The arguments above with respect to the Becker et al. '626 patent are incorporated by reference.

Claims 1 and 16 have been amended and, as amended, the rejections thereto and to the claims dependent thereon are respectfully traversed as all of the features of the independent claims are not disclosed, taught or suggested by the cited prior art.

The WO '415 reference does not account for the deficiencies of the Becker '626 patent. The WO '415 reference discloses a method of determining the surface topology of a portion of a three-dimensional structure. However, in contrast to the presently claimed invention, the WO '415 reference does not disclose, teach, or suggest "milling an *inner* surface of said wax model corresponding to said *inner* surface of said virtual model" as recited in each of the amended independent claims of the present application. As neither the Becker et al. '626 patent nor the WO '415 reference discloses, teaches, or suggests milling an inner surface of the wax model such that it corresponds to an inner surface of the virtual model, neither the Becker et al. '626 patent nor the WO '415 reference renders the presently claimed invention obvious, nor does a combination of the references render the claims obvious. As such, the presently claimed invention is patentable over the cited prior art.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection under 35 U.S.C. §103(a).

**3. The Becker Et Al. '626 Patent In View Of The Hofmann Et Al. '732 Patent**

The Examiner rejected claim 11 under 35 U.S.C. §103(a) as being unpatentable over the Becker et al. '626 patent in view of the Hofmann et al. '732 patent.

**Response**

The arguments above with respect to the Becker et al. '626 patent are incorporated by reference.

Claims 1, 16, 27 and 28 have been amended and, as amended, the rejections thereto are respectfully traversed as all of the features of the independent claims are not disclosed, taught or suggested by the cited prior art.

The Hofmann et al. '732 patent does not account for the deficiencies of the Becker '626 patent. The Hofmann et al. '732 patent discloses a ceramic prosthesis made by pressing a molding composition under heat and pressure. However, in contrast to the presently claimed invention, neither the Becker et al. '626 patent nor the Hofmann et al. '732 patent discloses, teaches, or suggests "milling an inner surface of said wax model corresponding to said inner surface of said virtual model" as recited in each of the amended independent claims of the present application. As neither the Becker et al. '626 patent nor the Hofmann et al. '732 patent discloses, teaches, or suggests milling an inner surface of the wax model such that it corresponds to an inner surface of the virtual model, neither the Becker et al. '626 patent nor the Hofmann et al. '732 patent renders the presently claimed invention obvious, nor does the combination of references render the claims obvious. As such, the presently claimed invention is patentable over the cited prior art.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw

the rejection under 35 U.S.C. §103(a).

**4. The Embert et al. '764 Patent In View of The Becker et al. '626 Patent And Further In View Of The WO '415 Reference**

The Examiner rejected claims 4 and 18 as being unpatentable over the Embert et al. '764 patent in view of the Becker et al. '626 patent in further view of the WO '415 reference.

**Response**

The arguments above with respect to the Embert et al. '764 patent, the Becker et al. '626 patent, and the WO '415 reference are incorporated by reference.

Claims 1 and 16 have been amended and, as amended, the rejections thereto and the rejections to the claims dependent thereon are respectfully traversed as all of the features of the independent claims are not disclosed, taught or suggested by the cited prior art.

As claims 1 and 16 have been shown above to be patentable over the cited prior art, Applicants submit that claims 4 and 18 are patentable over this additional combination of references as none of the references, alone or in combination, discloses, teaches, or suggests "milling an inner surface of said wax model corresponding to said inner surface of said virtual model" as recited in each of the amended independent claims of the present application. As such, the cited prior art does not render the presently claimed invention obvious. Therefore, the presently claimed invention is patentable over the cited prior art.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection under 35 U.S.C. §103(a).

**5. The Embert Et Al. '764 Patent In View Of The Becker Et Al. '626 Patent In Further View Of The Hofmann Et Al. '732 Patent**

The Examiner rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over the Embert et al. '764 patent in view of the Becker et al. '626 patent in further view of the Hofmann et al. '732 patent.

**Response**

The arguments above with respect to the Embert et al. '764 patent, the Becker et al. '626 patent, and the Hofmann et al. '732 patent are incorporated by reference.

Claim 1 has been amended and, as amended, the rejections thereto and the rejections to the claims dependent thereon are respectfully traversed as all of the features of the independent claims are not disclosed, taught or suggested by the cited prior art.

As claim 1 has been shown above to be patentable over the cited prior art, Applicants submit that claim 11 is patentable over this additional combination of references as none of the references, alone or in combination, discloses, teaches, or suggests "milling an inner surface of said wax model corresponding to said inner surface of said virtual model" as recited in amended independent claim 1. As such, the cited prior art does not render the presently claimed invention obvious. Therefore, the presently claimed invention is patentable over the cited prior art.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection under 35 U.S.C. § 103(a).

**CONCLUSION**

In light of the foregoing, Applicants submit that the application is now in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner contact the undersigned attorney if it is believed that such

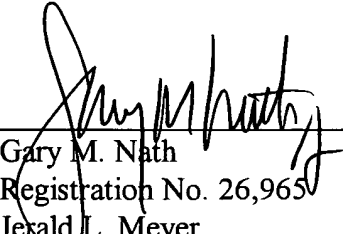
contact will expedite the prosecution of the application.

In the event this paper is not timely filed, Applicants petition for an appropriate extension of time. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 14-0112.

Respectfully submitted,  
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